

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

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*Ex parte* FRANKLIN E. PARKS,  
DEBKUMAR BHATTACHARJEE,  
and THELMA SANCHEZ

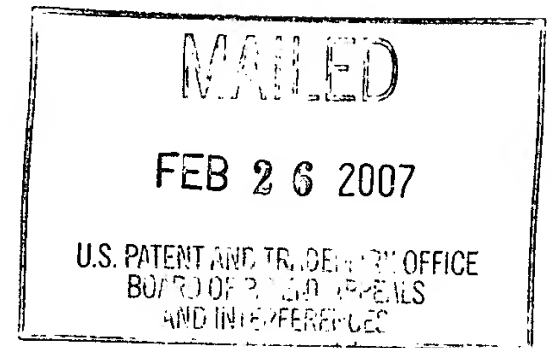
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Appeal 2006-2662  
Application 09/928,764  
Technology Center 1700

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ON BRIEF

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Before ADAMS, GRIMES, and GREEN, *Administrative Patent Judges*.

GRIMES, *Administrative Patent Judge*.

**DECISION ON APPEAL**

This appeal involves claims to an aqueous polyurethane dispersion, a polyurethane film, and a process of making a polyurethane film. The Examiner has rejected the claims as anticipated or obvious. We have jurisdiction under 35 U.S.C. § 134. We reverse.

**BACKGROUND**

The specification describes a polyurethane dispersion prepared by forming a non-ionic polyurethane prepolymer and dispersing the prepolymer

in water. (Specification 2.) The specification also describes using the dispersion to form a film. (*Id.*)

The specification describes preparing the prepolymer from a “formulation including a diisocyanate and an active hydrogen containing material.” (*Id.* at 3.) An active hydrogen containing material can be, e.g., a diol. (*Id.* at 5.)

“Preferably, the diisocyanate is an aromatic diisocyanate selected from the group consisting of MDI [methylene diphenyldiisocyanate], TDI [toluene diisocyanate] and mixtures thereof.” (*Id.* at 4.) When MDI is used, “it preferably has a P,P’ isomer content of from about 99 percent to about 90 percent.” (*Id.* at 5.) “While MDI with such isomer distributions can be prepared by distillation during the MDI process, it can also be prepared by admixing commonly available products such as ISONATE 125M\* and ISONATE 500P\*.” (*Id.*)

## DISCUSSION

### 1. CLAIM CONSTRUCTION

Claims 1, 5, 7-9, 11, 12, 24, 25, and 27-41 are pending and on appeal. We will focus on claim 24, which is representative and reads as follows:

24. An aqueous polyurethane dispersion, comprising the product of dispersion in water a nonionic polyurethane prepolymer prepared from a prepolymer formulation including an MDI diisocyanate, the MDI having a P,P’- isomer content from 99 to 90 percent wherein the dispersion is formed in a two or more step process wherein:

- (1) in a first step the prepolymer is formed and, in a subsequent step,
- (2) an aqueous dispersion of the prepolymer is formed.

Thus, claim 24 is directed to an aqueous polyurethane dispersion prepared by forming a nonionic polyurethane prepolymer and then forming an aqueous dispersion of the prepolymer. The nonionic polyurethane prepolymer is prepared from a formulation including methylene diphenyldiisocyanate (MDI) having a P,P'-isomer content from 99 to 90 percent.

## 2. ANTICIPATION

Claims 1, 5, 7, 9, 24, 25, and 27-41 stand rejected under 35 U.S.C. § 102(e) as anticipated by Jakubowski 027.<sup>1</sup> The Examiner argues that Jakubowski 027 describes aqueous polyurethane dispersions that read on Appellants' claims, that the dispersion is produced "by dispersing a polyurethane prepolymer into water," and that Jakubowski 027 discloses "the use of 4,4'-MDI and polyol reactants for producing the prepolymer. See abstract, columns 3-5, and examples." (Answer 4.)

The Examiner argues that the claimed P,P'-isomer content is met "because the processing of 4,4'-MDI inherently yields an insignificant quantity of other isomers; as a result it is reasonable to conclude that the P,P'-isomer (in other words; 4,4'-isomer) content is slightly below 100 percent and meets the appellants' claimed percent values." (*Id.*) In particular, the Examiner argues that Friedel<sup>2</sup> and Fischer,<sup>3</sup> which were cited by Appellants in their traversal of this rejection, "disclose that high purity 4,4'-MDI ha[s] a content of 4,4'-isomer of at least 98%. . . . Since these high

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<sup>1</sup> Jakubowski et al., U.S. Patent No. 5,959,027, issued September 28, 1999.

<sup>2</sup> Friedel et al., U.S. Patent No. 4,118,410, issued October 3, 1978.

<sup>3</sup> Fischer, Great Britain Patent Specification No. 1,263,439, published February 9, 1972.

purity diisocyanates, having 98% 4,4'-MDI, meet appellants' claimed high isomer content MDI, the position is taken that these evidentiary references support the examiner's position that the 4,4'-MDI reactant of Jakubowski et al. inherently contains the claimed content of P,P'-isomer." (Answer 4-5.)

Appellants argue that Jakubowski 027 "does not disclose use of a MDI wherein the P,P'-isomer content of the MDI is between 90 to 99 percent." (Br. 4.) In particular, Appellants argue that the "Examiner has provided no basis upon which to conclude that 4,4'-MDI contains such 'insignificant' amounts of impurities to render a P,P'-isomer content of 99 percent. . . . Even if such 'insignificant' quantities were disclosed, an 'insignificant' quantity would imply trace amounts of impurities at ppm levels. 1% is equal to 10,000 ppm and 10,000 ppm is not considered an 'insignificant' quantity." (Br. 4-5.)

Appellants also argue that Jakubowski 027 "only discloses the P,P'-isomer which the Examiner concedes is the high purity isomer. A high purity isomer would have a P,P'-isomer content in excess of 99 percent." (Br. 5.) In support of this position, Appellants refer to Friedel (cols. 1 and 2 and col. 4, ll. 11-33) and Fischer (p. 3, ll. 72-83). Appellants state that, in Friedel, "it is reported that the 4,4'-isomer which is 'considerably higher than 99%' is obtained by crystallization, distillation and displacement washing." (Br. 5.)

In addition, Appellants argue that, in the Examples of Jakubowski 027, "the P,P' isomer content of the MDI component is at best no greater than 76 percent. . . . Note that the isocyanate of *Jakubowski* is derived from a 50:50 mixture of 4, 4'-diisocyanatodiphenylmethane and 2, 4'-diisocyanato-

diphenylmethane, col. 5, ll. 20-25 as well as col. 7, ll. 27-30. *See*, for instance, lines 19-29 of column 5 wherein a 50:50 mixture of 4,4' and 2,4' isomer is disclosed.” (Br. 5-6.)

We conclude that the Examiner has not set forth a *prima facie* case that Jakubowski 027 anticipates claim 24. As noted by Appellants, Jakubowski 027 does not exemplify an aqueous dispersion formed from MDI having a P,P'-isomer content of 90 to 99 percent. The examples included in Jakubowski 027 only describe latex formed from a 50:50 mixture of the 4,4' and 2,4'-isomers (cols. 7-8).

In addition, although Jakubowski 027 identifies 4,4'-MDI as a preferred diisocyanate (col. 2, l. 63, to col. 3, l. 12), we conclude that the Examiner has not set forth a *prima facie* case that 4,4'-MDI inherently contains the P,P'-isomer content recited in claim 24. The Examiner has provided no evidence to support his position that the 4,4'-MDI taught by Jakubowski 027 would have inherently contained only 90-99% 4,4'-MDI.

Friedel and Fischer describe techniques for achieving a 4,4'-MDI content of more than 99% (Friedel, col. 4, ll. 23-26; Fischer, p. 3, ll. 73-78). Both of these references were published more than 20 years before the effective filing date of the present application. Given that ways to achieve a 4,4'-MDI content of more than 99% were known well before the time of the present invention, we do not agree that these references support the Examiner's position that the 4,4'-MDI disclosed by Jakubowski 027 would have inherently contained between 1% and 10% impurities, and therefore meet the claim limitation of 90-99% P,P'-isomer content.

We conclude that the Examiner has not set forth a prima facie case that Jakubowski 027 describes a polyurethane prepolymer prepared from a formulation including a MDI diisocyanate having a P,P'-isomer content of 90 to 99 percent, or a dispersion or film formed from this prepolymer. We therefore reverse the § 102 rejection of claims 1, 5, 7, 9, 24, 25, and 27-41 over Jakubowski 027.

Claims 1, 5, 7, 9, 24, 25, and 27-41 stand rejected under 35 U.S.C. § 102(a) as anticipated by Jakubowski 552<sup>4</sup> and claims 1, 5, 7, 9, 11, 24, 25, and 27-41 stand rejected under 35 U.S.C. § 102(a) as anticipated by Tabor.<sup>5</sup> The Examiner's and Appellants' arguments with regard to these rejections are substantially the same as the arguments raised with regard to Jakubowski 027. For the reasons set forth above, we conclude that the Examiner has not set forth a prima facie case that Jakubowski 552 or Tabor describes a polyurethane prepolymer prepared from a formulation including a MDI diisocyanate having a P,P'-isomer content of 90 to 99 percent, or a dispersion or film formed from this prepolymer. Therefore, we also reverse the § 102 rejections over Jakubowski 552 and Tabor.

## 2. OBVIOUSNESS

Claims 8, 11, and 12 stand rejected under 35 U.S.C. § 103 as obvious over Jakubowski 552 or Tabor in view of Alsaffar.<sup>6</sup> Claims 8, 11, and 12 each depend from either claim 1 or claim 9. We have already concluded that

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<sup>4</sup> Jakubowski et al., PCT Published Patent Application No. WO 98/41552, published September 24, 1998.

<sup>5</sup> Tabor et al., PCT Published Patent Application No. WO 98/41554, published September 24, 1998.

<sup>6</sup> Alsaffar, U.S. Patent No. 6,389,602 B1, issued May 21, 2002.

the Examiner has not set forth a prima facie case that Jakubowski 552 or Tabor anticipates claims 1. Claim 9 also requires use of “MDI having a P,P’-isomer content from 99 to 90 percent,” so our reasoning above applies equally to claim 9.

The present rejection is for obviousness, not anticipation, but the Examiner has not set forth sufficient basis to conclude that claim 1 or 9 would have been obvious over Jakubowski 552 or Tabor. The Examiner relies on Alsaffar only for limitations recited in the dependent claims, and has not pointed to any disclosure in Alsaffar that would make up for the deficiencies discussed above. Thus, we conclude that the Examiner has not set forth a prima facie case that claims 8, 11 and 12 would have been obvious in view of the cited references. We therefore reverse the obviousness rejection of these claims.

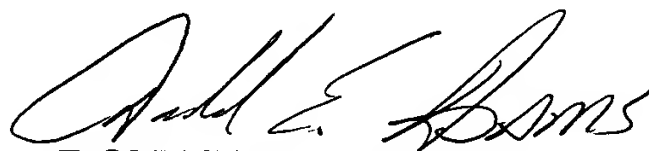
#### OTHER ISSUES

For the reasons discussed above, we have concluded that the Examiner has not set forth a prima facie case that Jakubowski 027, Jakubowski 552, or Tabor anticipates the present claims. However, we note that Friedel and Fischer disclose incompletely purified compositions containing, e.g., about 98% 4,4’-MDI. On return of this case, the Examiner should consider whether those of ordinary skill in the art would have found it obvious to combine the 98% 4,4’-MDI taught by Friedel or Fischer with the methods taught by Jakubowski 027, Jakubowski 552, and/or Tabor. If so, an obviousness rejection based on the combined teachings of the prior art may be appropriate.

SUMMARY

The Examiner has not shown that the claims were anticipated or would have been obvious to a person of ordinary skill in the art based on the applied references. We therefore reverse the § 102 and § 103 rejections.

REVERSED



DONALD E. ADAMS  
Administrative Patent Judge



ERIC GRIMES  
Administrative Patent Judge



LORA M. GREEN  
Administrative Patent Judge

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- Appeal No. 2006-2662
- Application No. 09/928,764

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